

What is claimed is:

1 *B²7* 1) A sputtered silicon structure being positioned on a
2 work piece together with an operational circuitry and
3 being formed on top of a sacrificial layer, said
4 sputtered silicon structure having a thermal
5 fabrication budget, said operational circuitry having
6 a first critical thermal budget, wherein said thermal
7 fabrication budget is smaller than said first critical
8 thermal budget.

1 2) A sputtered silicon structure being formed on top of a
2 sacrificial layer, said sputtered silicon structure
3 having a thermal fabrication budget, said sacrificial
4 layer having a second critical thermal budget, wherein
5 said thermal fabrication budget is smaller than said
6 second critical thermal budget.

1 3) The sputtered silicon structure of claim 1, wherein
2 said sacrificial layer is made from a material
3 dissolvable by a wet etchant.

1 4) The sputtered silicon structure of claim 3,
2 wherein said wet etchant is selected from a
3 group consisting of 6:1-20:1 buffered HF and
4 $\text{NH}_4\text{HF} + \text{HC}_2\text{H}_3\text{O}_2 + \text{H}_2\text{O}$.

1 5) The sputtered silicon structure of claim 4
2 having a first permeability rate that is up to
3 ten times higher than a second wet etchant
4 permeability rate of a comparable polysilicon
5 structure.

3 essentially buckling-free deformation
4 configuration.

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6 *Cont'd from 132* 7
8 14) The sputtered silicon structure of claim 13
9 resulting from a sputtering with first
10 sputtering criteria including:

11 A) an etchant selection; and

12 B) a sputtered structure thickness.

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14 15) The sputtered silicon structure of claim
15 14, wherein said etchant selection is
16 made from a group consisting of 6-20:1
17 buffered HF and $\text{NH}_4\text{HF} + \text{HC}_2\text{H}_3\text{O}_2 + \text{H}_2\text{O}$.

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19 *sub. 1610* 20 16) The sputtered silicon structure of claim 13
21 having a variable sputtered layer thickness
22 and a correlated curvature, wherein said
23 correlated curvature essentially reduces
24 with the square of an increase of the
25 variable sputtered layer thickness for
26 constant remaining first sputtering
27 criteria.

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29 17) The sputtered silicon structure of claim 12,
30 wherein said released element has an
31 essentially buckling-influenced deformation
32 configuration.

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34 18) The sputtered silicon structure of claim 17
35 resulting from a sputtering with second
36 sputtering criteria including:

37 A) a sputtering power selection;

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C) a sacrificial layer material;

20) The sputtered silicon structure of claim 18, wherein said ambient sputtering pressure selection is within a range of 8-14mTorr argon.

21) The sputtered silicon structure of claim 18, wherein said sacrificial layer material is phosphosilicate glass.

22) The sputtered silicon structure of claim 18, wherein said sputtering power selection and said ambient sputtering pressure selection are zone-T type selections.

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1 24) The annealed sputtered structure of claim 23,
2 wherein said core layer includes silicon and
3 said conductive layer is sputtered from a
4 material selected from a group consisting of
5 TiW and TiN.
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1 25) A sputtered silicon structure forming a cavity wall
2 segment of a cavity within a work piece, said porous
3 structure being accessible and permeable for a
4 dissolving etchant capable of dissolving a cavity
5 defining sacrificial layer.
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1 26) The sputtered silicon structure of claim 25,
2 wherein said annealed sputtered structure further
3 comprises a sealing coating.
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1 27) The annealed sputtered structure of claim 26,
2 wherein said sealing coating comprises Si_3N_4 .
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1 28) A method of making a released sputtered silicon
2 structure positioned on a work piece together with a
3 electronic circuitry having a critical thermal
4 budget, said method comprising the steps of:
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6 A) assigning a deformation configuration to an
7 intended structure theoretically
8 representing said released sputtered
9 structure;

10 B) selecting sputtering criteria according to
11 said deformation configuration assigning;

12 C) providing a sacrificial layer;

- 13 D) sputtering a sputtered layer on top of said
14 sacrificial layer;
15 E) shaping a structure from said sputtered
16 layer; and
17 F) releasing said shaped structure by
18 dissolving said sacrificial layer.

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1 29) The method of claim 28, further comprising the
2 step of transforming said sputtered layer from a
3 pre-annealing configuration into a post-annealing
4 configuration by applying a low temperature
5 annealing process to said work piece, said low
6 temperature annealing process having a thermal
7 annealing budget smaller than said critical
8 thermal budget.

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1 30) The method of claim 29, whereby said low
2 temperature annealing process has a maximum
3 temperature of 450°C and said electronic
4 circuitry includes an aluminum-metalization.

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1 31) The method of claim 28, whereby said deformation
2 configuration is an essentially buckling-free
3 deformation configuration.

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1 32) The method of claim 31, whereby said selecting
2 includes:

- 3 A) selecting an etchant; and
4 B) selecting a thickness for said sputtered
5 layer.
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33) The method of claim 32, whereby said etching solvent is selected from a group consisting of 6-20:1 buffered HF and $\text{NH}_4\text{HF}+\text{HC}_2\text{H}_3\text{O}_2+\text{H}_2\text{O}$ for a sputtered layer including silicon.

34) The method of claim 28, whereby said deformation configuration is a buckling-influenced deformation configuration.

35) The method of claim 34, whereby said selecting includes:

- A) selecting a sputtering power;
- B) selecting an ambient sputtering pressure;
- C) selecting a material for said sacrificial layer;

36) The method of claim 35, whereby said sputtering power is selected between 1.5 and 2.5kW for a sputtered layer including silicon.

37) The method of claim 35, whereby said ambient sputtering pressure is selected between 8 and 14mTorr argon for a sputtered layer including silicon.

38) The method of claim 35, whereby said sacrificial layer material is selected from phosphosilicate glass for a sputtered layer including silicon.

